to send control signals comprising information based on the calculated first power sharing ratio, for controlling said first energy storage to inject an amount of power into the microgrid in accordance with the first power sharing ratio for correcting an observed deviation in the microgrid.

[0013] According to another aspect of the present invention, there is provided a computer program product comprising an embodiment of the computer program of the present invention, and a computer readable means on which the computer program is stored.

[0014] By transmitting the storage capability parameter of the first energy storage to the second control unit and receiving a, typically corresponding, storage capability parameter of the second energy storage from said second control unit, the first control unit is able to locally calculate the power sharing ratio for the first storage unit, without the need for a central control unit. Each of the energy storages is associated with its own control unit, e.g. positioned locally with its storage unit such as integrated in its storage control. The storage capability parameters may e.g. be broadcasted from each of the (or all participating) control units of respective energy storages to all of the other control units in the microgrid which are participating in power sharing.

[0015] The decentralised coordinated control in accordance with the present invention may provide more economic and stable system operation, as well as flexibility in allowing adding or removing of energy storages of the microgrid.

[0016] Generally, all terms used in the claims are to be interpreted according to their ordinary meaning in the technical field, unless explicitly defined otherwise herein. All references to "a/an/the element, apparatus, component, means, step, etc." are to be interpreted openly as referring to at least one instance of the element, apparatus, component, means, step, etc., unless explicitly stated otherwise. The steps of any method disclosed herein do not have to be performed in the exact order disclosed, unless explicitly stated. The use of "first", "second" etc. for different features/components of the present disclosure are only intended to distinguish the features/components from other similar features/components and not to impart any order or hierarchy to the features/components.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Embodiments will be described, by way of example, with reference to the accompanying drawings, in which:

[0018] FIG. **1** is a schematic circuit diagram of an embodiment of a microgrid in accordance with the present invention.

[0019] FIG. **2** is a schematic block diagram of a storage controller comprising an embodiment of a control unit in accordance with the present invention.

[0020] FIG. **3** is a more detailed schematic block diagram of a storage controller comprising an embodiment of a control unit in accordance with the present invention.

[0021] FIG. **4** is a schematic graph illustrating an embodiment of power sharing among energy storages based on gains for a frequency deviation in accordance with the present invention.

[0022] FIG. **5** is a schematic graph illustrating another embodiment of power sharing among energy storages based on gains for a frequency deviation in accordance with the present invention.

[0023] FIG. **6** is a schematic bar graph illustrating different examples of storage capability parameters of different energy storages.

[0024] FIG. **7** is another schematic bar graph illustrating different examples of storage capability parameters of different energy storages.

[0025] FIG. **8** is a schematic functional block diagram of an embodiment of the control unit of the present invention.

[0026] FIG. **9** is a schematic component block diagram of an embodiment of the control unit of the present invention.

[0027] FIG. **10** is a schematic flow chart of embodiments of the method of the present invention.

DETAILED DESCRIPTION

[0028] Embodiments will now be described more fully hereinafter with reference to the accompanying drawings, in which certain embodiments are shown. However, other embodiments in many different forms are possible within the scope of the present disclosure. Rather, the following embodiments are provided by way of example so that this disclosure will be thorough and complete, and will fully convey the scope of the disclosure to those skilled in the art. Like numbers refer to like elements throughout the description.

[0029] FIG. **1** illustrates an embodiment of a microgrid **1** comprising a plurality of distributed generators (DG) **5** as well as a plurality of energy storages **2** each comprising an energy storing device **4**, e.g. a battery or flywheel, and a local storage controller **3** for controlling the charging/discharging of power of the energy storing device **4**, e.g. injection of power into the microgrid. In accordance with the present invention, the storage controllers **3** can communicate with each other, e.g. via radio or wired signalling (possibly broadcasted), to exchange storage capability parameters of the respective energy storages **2** with each other, for enabling control of the storages **2** in a decentralized manner without the need for a central control unit.

[0030] FIG. **2** illustrates an embodiment of an energy storage **2** comprising a storage controller **3**, which is configured for controlling an energy storing device **4** by means of a converter **23**, also forming part of the energy storage **2**, via which the energy storing device **4** is connected in the microgrid **1**. The storage controller **3** comprises a regular control module, herein called the storage primary control **22**, as well as a control unit **21**, herein called the storage participation controller, in accordance with the present invention. In accordance with the present invention, the participation controller **21** governs the participation of the energy storage **2** in power sharing with other energy storages in the microgrid. The participation controller **21** obtains one or more capability parameters of the energy storing device **4**, e.g. available energy stored (energy state), power rating, current limit, and/or charge/discharge rate limit. The frequency of e.g. energy state sampling may be in the range of every 1-10 minutes, which is much slower than the control loops in the primary controller. The parameters may also or alternatively relate to other parts of the energy storage **2** than the energy storing device **4**, e.g. power rating etc. of the converter (e.g. a voltage sourced converter, VSC). It stores these parameters and transmits it to one or more other participation controllers of other energy storages in the microgrid **1**. The same procedure is followed by the other energy storages, whereby the participation controller **21** also receives corresponding capability parameter(s) from the